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ABSTRACT

According to this author, library classification should be viewed in its broader context of the classification of knowledge--the orderly arrangement of thoughts and things for convenient reference. This has been an activity of man since his earliest days, when primitive man first classified animals and plants in the interest of food. Philosophers, including Aristotle and Roger Bacon, have always been concerned with the arrangement, not only of objects, but of knowledge, into definable catagories. Library classification--practical systems for the arrangement of books on shelves--has also existed since ancient times. Librarians have relied, in their arrangements, on the knowledge schemes created by philosophers. As knowledge, and the number of books, have increased, new library schemes have been developed. The 19th Century saw many such schemes, notably the Dewey system. Because of the dynamic nature of knowledge itself, library classification schemes are unlikely ever to be stabilized. At present, librarians are attempting to fill the gaps by creating special systems for individual subjects such as business and medicine. (SL)

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Outline History of Classification:

an Essay

by

Emanuel Benjamin Ocran

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PREFACE

I have written this essay primarily for students who are in library schools pursuing courses in the ramifications of classification. As a subject for library education, librarians have more or less taken a narrow view of classification and failed to appreciate it as a subject with immense academic interest. To many librarians classification means only one thing and that is for arranging books and other items in the library for retrieval purposes. I have sought to make the prospective librarian approach the subject of classification in a fluid state of mind and this fluidity could be achieved in part by acquiring an outlined knowledge of the history of classification.

There are four areas to which this essay is intended.

Firstly, it is intended to make the student librarian aware of the philosophic overtones of classification.

Secondly, it is intended to show the scholastic quality of classification as studied by people like Aristotle, Linneus and Darwin who have contributed so much towards the progress of civilization. The systematic reasoning shown in the works of these scholars never fails to excercise the mind of the reader.

Thirdly, it is intended to make the student librarian look beyond librarianship for inspiration in his studies on classification.

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Thirdly, it is intended to make the student librarian look beyond librarianship for inspiration in his studies on classification.

Fourthly, it is intended to make instructors in classification aware of possible approaches to the teaching of classification and to enable them to prepare the ground for receptive students by pursuing their own readings on the history of classification. Without a sophisticated historic knowledge of classification by instructors, it will be extremely difficult to impart any qualified knowledge on classification to students.

I feel that there is a real need for an essay of this nature. It is not detailed and the intention is to render it as briefly as possible and as plain as it is within my knowledge. Classification has always been a controversial subject and any criticisms of this essay will be warmly accepted by me

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CHAPTER ONE

In the Beginning

It is not easy to state with absolute certainty when classification began but since all human activities involve discipline, orderly care and convenience, it is right to assume that classification which is an orderly arrangement of thought and things for convenient reference is as old as creation. Creation separated the land from the sea and plants from animals.

It appears that classification of things started when life began. But no one knows when or where life began and experts have tried to define life without any appreciable success. Like life, classification too became complex as it developed and its history has become a subject to be sought in times far removed from our own. [2]

Life did not begin with man but whatever developed into man came into being with classificatory powers. When man began to reason for himself in remote primitive times, terminology came into use and this aided the classificatory powers of man. Man was then able to differentiate between things of likeness and things of unlikeness. Food being an important item for the existence of man, it wouldn't be wrong to think that man first thought of differentiating between the various plants and animals. Thus edible fruits and poisonous

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fruits were identified and under these major divisions, names were given to the various fruits. It is impossible to know the actual terminology used for these divisions but there is no doubt that they were conceived and the very conception of these ideals gives substantial support to these claims.

Man himself is an animal but by virtue of his superiority, man hunted other animals for food and to distinguish them, man placed the lower animals in categories based on their relations to himself - as dangerous or harmless, useful or useless. [3] These categories are justified by their utility to man but it is not known which plants and animals man discovered first to enable him to make these differentiations. It is impossible to carry our findings back from the present day and this makes it difficult to establish that man constructed a positive classification in the beginning. The uncertainty of man's discovery in order of time and events makes us content to accept the fact that man established a relative classification in the beginning. As time went on , important discoveries were made which bore relations to existing ones and by fitting them into the correct categories, man produced a relative classification.

It is reasonably safe to assume that relative classification physically came into existence after the Geological Times. These are the far distant epochs, before man appeared on the scene of creation. As life did not begin with man and evolution led on to

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new species, man's claim to the production of a relative classification was his ability to conceive, perceive and to construct an order of things. Man made himself a creator by the possession of these qualities.

As man's ability to recognise and identify newly found objects grew keener, he was able to develop his relative classification of things and relied less and less on positive classification. This is because positive classification is not satisfactory in an expanded knowledge. Eventually the relative classification is the more useful of the two.

The establishment of a positive classification was a great step forward in the recording of things in their proper order and geologists were able to use it for their systems of chronology. There is what geologists and anthropologists call a positive chronology. The basis of positive chronology is attributed to Swedish geologists. It is also known that positive classification enabled geologists to complete chronological tables back to far reaching years. [4]

The ancient world had enough material to aid geologists in their systems of chronology. Baked clay tablets with cuneiform inscriptions which were discovered in the Mesopotamia have a list of

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DATE	DYNASTY	KINGS	DATE
B.C.	VI	Teti	B.C.
2700	V	Unis Ded Kere Iseri Menkauhor Neuserre An Khaneferre Neferefre ShepsesKere NefeririKere KaKau Sahure User Kaf	2700
2800	IV	..*..*.. ShepsesKaf MenKaure (Mycerinus) Khafre (Chephren) Kededef Khufu (Cheops) Sharu	2800
2900	III	Snefru Neferke SaneKht Zoser KhaseKhemui	2900
3000	II	Senedi Peribsen SeKhemib Perenmaat Neneter Reneb HotepseKhemui	3000
3100			3100
3200	I	Ka Sen SemerKhat Enezib Merpeba Enezib Merpeba Den (Semti) Za Zer (Atoti) Aha.Men Narmer (Menes)	3200
3300			3300
3400			3400

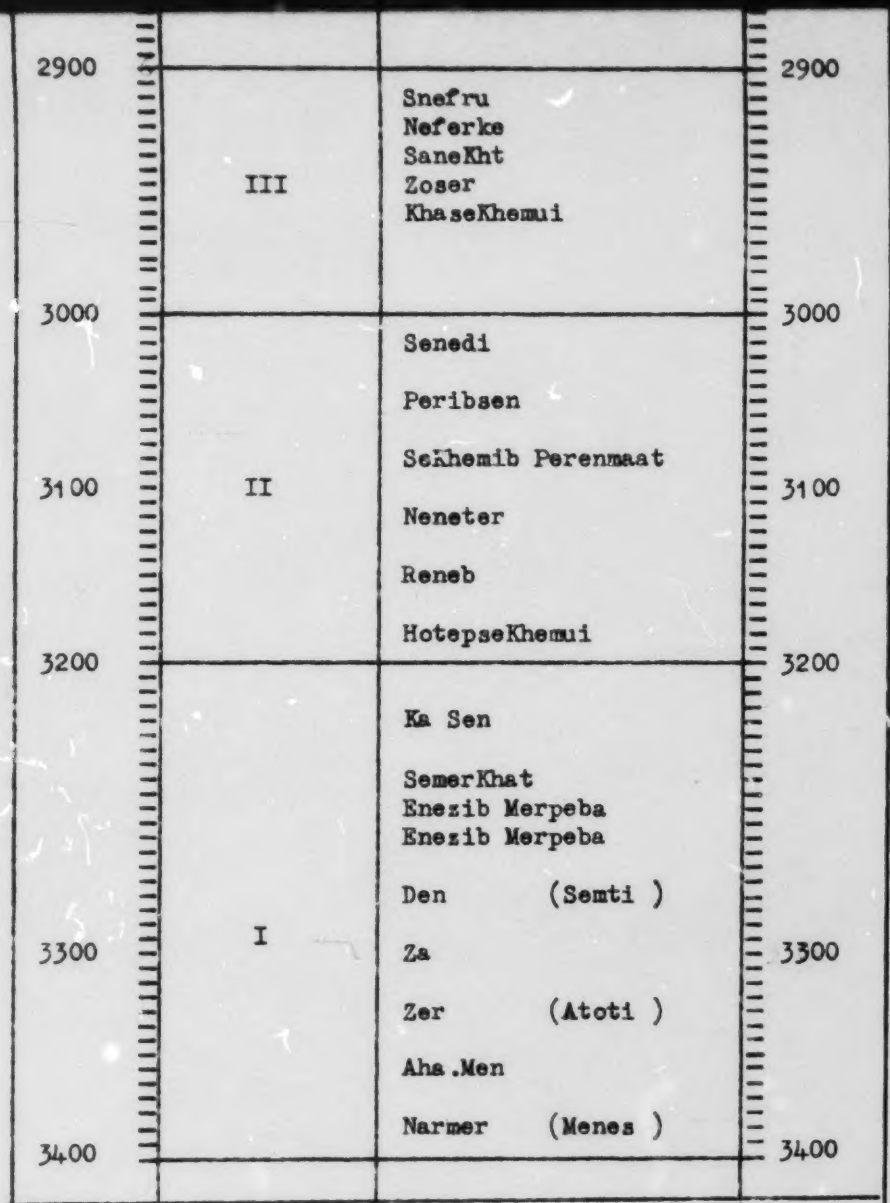

Chart showing Kings of the Old Kingdom of Egypt

Chart reads in order of time, from the bottom upwards

Fig. 1

kings of Babylonia and Assyria on them and these tablets have made it posible to compile a complete chronology back almost to 1000 B.C. Picneers of positive classification in the third century of the Christian Era include Julius Africanus [5] and Eusebius [6]. Julius Africanus and Eusebius attempted to draw up "World histories" on a chronological basis but this feat was highly impossible because there were gaps in the recordings of those they derived their information from - due to missing tablets. The 'Chronicle' which was Eusebius's first work appeared in about 303 A.D. and it dealt with an outline of universal history. Julius Africanus was a Christian traveller who wrote a history of the world from the creation to 221 A.D.

Not only tablets but also papyrus have helped in the construction of positive chronology. It should be appreciated that positive classification for chronological purposes centered on kings and their dynasties. The principle for the calculation of the founder of the first dynasty was based on the method of dead reckoning but gaps prevented any accurate estimation of a whole period by means of dead reckoning. Fig. 1 illustrates how positive classification is applied to systems of chronology [7].

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CHAPTER TWO

Natural Systems

After the establishment of positive and relative classifications, the subject expanded over the years and soon classification demanded new qualifications. One such qualification was the natural system. There is no exact scientific definition for a natural system but there are expressions in professional circles by scientists on the definition of life which come near enough to the definition of a natural system. [8]

Librarians have always understood that a natural system or a natural classification is one which exhibits the inherent properties of the things classified. If this is true then a positive system of chronology should be regarded as a natural system because as the chart on dynasties would show (Fig. 1) succeeding kings ruled by right of natural inheritance. Here we are halted in our trend of thought by events in history which remind us that it is possible for an outsider not in the least connected to the throne, stool or skin to take up arms and proclaim himself a natural successor to whatever is being contested. Perhaps a more convincing argument is that, if by nature land is separated from water and all fishes put in water because they all possess properties which made life adaptable in

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water, and all humans and animals put on land because they possess properties inherent to each other as land dwellers, does that not constitute a natual classification. But nature is unreliable in its groupings and some of the inherent properties possessed by land dwellers are common to water dwellers. Fishes have mouth and eyes and almost all have endo-skeleton and all humans have mouth, eyes and endo-skeleton but they are not grouped together in any natural grouping even though they possess inherent properties. These are some of the difficulties which make the definition of a natual system almost impossible.

As late as 1950, B.H. Dansar [9] was lamenting the difficulty of defining natural groups. Simpson (1961) in his "Classification of animals ...", agrees that in fact much of the theoretical discussions in the history of taxonomy has, beneath its personal language and objective facade, been an attempt to find a theoretical basis for those personal and suggestive results. The truth is, what constitutes a natural system is founded on theoretical basis.

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ernestness to those of librarians. J.S.L. Gilmour, a taxonomist has emphasised that the nature of taxonomy depends on purpose and that taxonomists could arrange living creatures in many ways but they choose one way because they think that is best for a purpose.

Early attempts on natural systems were based on Aristotelian logic. This was the method favoured by pioneers of systematics - like John Ray and largely by Linnaeus and Darwin. Systematics is the study of species and of the higher groups of classification, began by the recognition of differences between species, defined from type specimens preserved in museums. [10]

John Ray (1627-1705) an English naturalist, often regarded as the father of English natural history contributed substantially towards the science of systematics. His "Catalogus plantarum Angliae" is the basis of all later English floras. In his early works, he classified his plants alphabetically but he later used the number of cotyledons as the basis of his classification. Ray toured extensively throughout Europe and Britain and collected a lot of material for his classification.

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classification of plants and animals. Like Ray, he toured extensively in his work as a botanist and published outstanding works in connection with botanical classification. His 'System naturae' brought him international fame and he followed it up with others like the 'Genera plantorium' and the 'Species plantarium'.

The Asistoterian system was an attempt to discover and define the essence of a group or the real nature of a group. This essence gives rise to properties which are evidences in themselves. For example, the essence of a house is expressed by its definition as a dwelling place for animals, plants, men and things and that it could have windows and doors and it could be built on either land, water or in space. Earlier systematicians assumed the position that natural systems could be of this kind but the application of definitions to things of the same group is limited as it is obvious that not all houses are buit on land but there are some built underground, under water and in space and there are some built for animals and not for humans. Hence the many names given to what basically should be called a house. Any listing of the essence of a basic character or object gives rise to a relative classification and this fact underlies the development of relative classification.

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There was re-thinking towards natural classification in the writings of many naturalists of the seventeeth century. Among these naturalists was John Ray who first attempted to give precision to the concept of 'species' as the unit of biological classification and the Swede Linnaeus whose "Systema naturae" was published in 1735 and predominated the eighteenth century scene. Linnaeus attempted to classify the whole of created things and in his "Systema naturae" he provided a system of pigeon holes and his instructions for the description and classification of nature are still regarded as adequate for the description of newly discriminated species of plants, animals and materials. [12] It is however believed that the works of Linnaeus were influenced by John Ray and Conrad Gesner (1551-1587) but there is no definite proof to this claim. Linnaeus subscribed to the definition that a natural system should exhibit common attributes. His "Methodus" rendered into English by Karl P. Schmidt has instructions to this effect. There are seven divisions in the "Methodus" which run as follows:

1. Names
2. Theory
3. Genus
4. Species
5. Attributes
6. Uses

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2. Theory
3. Genus
4. Species
5. Attributes
6. Uses
7. Literature

and .../

The following are the instructions under attributes:

V ATTRIBUTES

22. Include what is known about the season of birth, growth, and maturity, with mode of breeding and of birth or hatching, old age and death.

23. State the locality, giving the geographic region and political province.

24. Give the latitude and longitude.

25. Describe the climate and soil.

26. Give an account of the diet, habits and temperament.

27. Describe the anatomy of the body, particularly any remarkable features, together with microscopic examination.

It should be borne in mind that these instructions were meant for the zoologist, botanist and the geologist to correctly and successfully put together the history of each and every natural object. When the purpose of a natural system is restricted, it

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becomes a special classification and its use also become limited. To enable a natural system to become a widely accepted system by broadening its purpose, Linnaeus's instructions on use run as follows:

VI USE

28. List the economic uses, actual and possible, among various peoples.

29. State dietary uses, with the effect on the human body.

30. State the physical uses, with the mode of operation and the constituent elements (presumably e.g. use of wood, etc.)

31. State the chemical uses according to the constituent substances from analysis.

32. State the medical uses, in which diseases and with what results, according to reason and experience.

33. Give the pharmaceutical information as to what parts are used, method of preparation, and composition.

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33. Give the pharmaceutical information as to what parts are used, method of preparation, and composition.

34. Give directions for medical use, with emphasis on the best method, dosage, and necessary precautions.

It has .../

It has been pointed out by Schmidt that the 'Methodus' is a bibliographic curiosity and would form an appropriate introduction to any modern work on the methods and procedures of taxonomy.

As shown in the 'Methodus' instructions, the acceptance by naturarists of the fact that a natural system must have basis in the community of descent has led to much attention being directed towards tracing the lineages of the main groups - animals and plants - and subjects which come under knowledge classification.

The tracing of lineages as a special subject interest brought Darwin and Wallace into prominence in the nineteenth century. Wallace expressed opinion based on facts that in the fossil record large groups extend through several geological formations and "no group of species has come into existence twice". Wallace drew the conclusion that "Every species has come into existence coincident both in space and time with a pre-existing closely allied species". His convictions led him to state further, "The natural series of affinities will always represent the order in which the several species came into existence, each one having had as its immediate antitype a closely allied species existing at the time of its origin. It is evidently possible that two or three distinct species may have had a common antitype from which other closely allied species were created". [13] With these convictions, Wallace was able to give a simple explanation of natural classification.

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Alfred .../

Alfred Russel Wallace (1823-1913) [14] was a British naturalist who travelled extensively since he first took interest in 1840. In 1848 he went to the Amazon on an expedition and published an account of his expedition in 1853. He also made a tour of the Malay Archipelago and an account of this appeared in 1869. Wallace originated the theory of natural selection during his travels. He read Malthus's 'Essay on population" which gave him the idea of the 'survival of the fittest'. He was then at Sarawak and he forwarded a manuscript of his thoughts to Charles Darwin who was then in England. The two naturalists became known to each other through this communication. In Wallace's manuscript Darwin recognised his own theories. Wallace's essay to Darwin entitled 'On the tendency of varieties to depart indefinitely from the original type' was read jointly with an abstract of Darwin's own views at the Linnean Society on July 1, 1858. Charles Robert Darwin (1809-1882) had his great work 'On the origin of species ...' published in 1859.

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CHAPTER THREE

Artificial Systems

Recorded evidence proves that artificial systems grew alongside natural systems. Pioneers of natural systems in their zeal to produce systems based on inherent properties faltered accidentally and produced artificial systems. Lennaeus who followed John Ray as a natural 'systematists', produced a system more artificial than that of Ray and succeeded to emulate the popularity of the Ray system.

Artificial systems as defined depended on arbitrarily chosen characteristics of accidence which bear no relation to their inherent properties. An example of an artificial classification was that show by Stanley Jast in lectures at the London School of Economics in 1905. He used the consonants of the alphabet to illustrate an artificial system. He arranged these consonants artificially by the position of the letters in space and appeared as follows:

1. Letters resting on the line: W, X, V, C, M, N, etc.
2. Letters resting on and rising above the line: d, b, l, t, etc.
3. Letters passing through the line: p, q, g, etc.
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Sayers .../

Sayers points out that the only artificial thing about the arrangement of these consonants is the accidence of their shape.

Botanists classified flowers by the number of stamens and pistals and this still applies in the plant kingdom.

According to Darwin, all members of a species are not identical but show variations in size, strength, health, fertility, instinct, habits, mental attributes, and countless other characteristics. He saw that such variations have been turned into good use by man in the course of artificial selection. Artificial selection which leads to artificial classification has for a long time been practiced by man in his everyday life. The farmer for example will select and breed a particular type of cattle from which a particular object is derived; he will select and grow a particular type of crop, say maize which has a shorter duration on the farm for harvesting. Darwin believed that in a state of nature, selection works automatically and this made him apply the term 'Natural Selection'.

Artificial classification exists in all societies as anthropologists have shown in their studies. In some African societies, there is what is known as the age group system which is an artificial classification based on age. Children

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Artificial classification exists in all societies as anthropologists have shown in their studies. In some African societies, there is what is known as the age group system which is an artificial classification based on age. Children born in the same year belong to the same group and they associate with each other as playmates. Each succeeding age

forms .../

forms a new group. Very often, marriages took place among people of the same or different age groups and the issues of the same year do not form subordinate groups to the parent group but entirely new and independent groups. Of course this classification is for anthropological studies and does not in any way disrupt the coherent nature of the society.

An artificial system always proves to be more flexible and accommodating than a natural system. There is always room for newly found material as the age groups in some African societies show.

Artificial systems have been based on resort to one or more criterians and these provide a ready means of subdivision.[16]. Such classifications are based on the small number of criteria as well as the small number of purposed which they serve. Purpose has always been a dynamic factor in all classifications and to leave it out in the formulation of any system of classification is to creat confusion. Purpose demands a special attention in an artificial classification and this is very significant because a classification scheme which does not show any purpose behind it is inadequate.

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CHAPTER FOUR

Classification of Knowledge

Knowledge is science and, as Henry Wilson has said, "Science is science only because it is progressive and its pregress and change means the acquisition of new facts and the detection of new fallacies". Ancient philosophers realised this and devised classification schemes to suit the existing knowledge of things. "But the prevailing idea of library classification has been a preconceived scheme or cadre devised according to some philosophy, with a harmonious taxonomy and symmetrical series of '-ologies'. Then into this abstract skeleton, the titles of books were to be fitted to take the place of flesh and blood and give it a concrete existence ..." [17] Knowledge classification is in fact library classification and librarians in formulating schemes for their libraries have either consciously or of unconsciously followed the principles laid down by philosophers and naturalists. As Henry Wilson continues in his article on classification in public libraries, "The natural system, if I may thus apply the term, may, I perceive, be also followed in the library. I mean that the books as they are taken, examined, and catalogued, must just like the plants in the hands of the botanist, themselves suggest the subdivisions of the system, according to their character and affinities. This is the way in which in their turn, the products of nature have been catalogued, and I believe the same plan will be the best to

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is .../

is natural building, to pile them into preconceived shapes is artificial" [18]

A great philosopher who attempted to classify knowledge was Plato under whom Aristotle studied. Plato's classificatory ability was based on distinctions and he expressed these in the mouths of people like Socrates, Parmenides and the Pythagorean Timaeus. Through personalities in his dialogues, he distinguished between such things as justice, wisdom, courage and temperance.

Although Aristotle was a pupil of Plato, he formulated his own philosophical ideas and made himself an outstanding philosopher worthy of note. Aristotle devised his own classification of knowledge and for two thousand years, the classification of knowledge followed the pattern laid down by Aristotle. The Aristotelian classification became less useful at the end of the seventeenth century. In his classification, Aristotle divided knowledge into three parts.

(a) The Theoretical - aims at knowledge for its own sake.

(b) The Practical - seeks knowledge as a guide to conduct.

(c) The Productive - used in making things useful or beautiful.

The theoretical knowledge which forms the first part, more or less resembles the mordern concept of science. The theoretical knowledge was further divided into:-

(a) Theory of metaphysics

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(a) Theory of metaphysics

(b) Mathematics

(c) Physics

Mathematics ..✓

Mathematics included Plato's sciences with Optics and Mechanics added and this grouping proved more extensive than Plato's.

Gradually, man's concept of knowledge grew wider and wider and made possible the expansion of knowledge classification. Scientific disciplines became popular and brought about the Mediaeval Sciences. Medicine was added to the list of sciences and so was the Mechanical Arts. Among philosophers of the mediaval period was Roger Bacon (1220-1292) who compiled a large encyclopaedia arranged in four parts.

Grammar and Logic

Mathematics

Natural Science

Metaphysics and Moral

Bacon was a desciple of Aristotle. As the classification of knowledge expanded it became increasingly difficult to incorporate newly found subjects into the existing schemes. Science had espanded and industrial knowledge and disciplines had been established. It became necessary to formulate schedules for classification. The Tree of Porphyry or the Ramean Tree was known and had been the backbone of many schemes. Roger Bacon solved the problem of finding new schedules for classification schemes by presenting the tree in this form:

Substance .../

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Substance .../

Substance

Incorporation

Corporeal

Body

Inanimate

Animate

Living Beings

Insensible

Sensible

Animal

Irrational

Rational

Man

Socrates - Plato - Other Man

Since then the Tree of Porphyry has been the framework on which most modern classification schemes are structured.

The fourteenth and fifteenth centuries were uneventful in the history of knowledge classification. Scholars on classification regarded the fifteenth century as the end of ancient classifications and the sixteenth century as the beginning of modern classifications. The fifteenth century ended with Aldus Marutius's classification which was published in 1498.

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It is interesting to note that the shackles of the so called

ancient .../

ancient classifications of which Plato, Aristotle and others were pioneers, were not discarded by modern classificationists. Some of the virtues of ancient classifications were incorporated in the modern classifications.

An outstanding personality whose work marked the birth of modern classification was Conrad Gesner, a physician, naturalist, philosopher and bibliographer. Gesner produced many works and of these, the one which is most important in this history is his 'Bibliotheca Universalis' which was published in 1545. This work was designed in three parts. The first was an alphabetical subject list, the second was a classified arrangement and the third was an alphabetical subject datalogue. The second part which constituted Gesner's classification of knowledge is entitled 'Pendents' and was published in Zurich in 1548. [20] In Gesner's classification books were divided into two series of large and small and arranged in some order on the shelves. The books were lettered with M for large books and P for smaller books and size notation as well as book numbers were given. Thus the arrangement of books on the shelves appeared as follows:- [21]

The Books .../

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The Books .../

The Books Themselves:-

Catullus	M	I	1
Tibullus	M	II	2
Beda	M	III	3
Ausus	M	IV	4
Julius	M	V	5
Pollux	M	VI	6
Avicenna	M	XII	7
Serapio	M	XIII	8
Rhasis	M	XIV	9
Cato	P	VII	10
Galenus	P	VIII	II
Hippocrates	P	X	13
Musa	P	XI	14

Besides this arrangement, changes could be organised to obtain other subject and accession indexes. A study of Gesner's 'Pendents' shows the order of learning at that time. Gesner's Pendents is looked on as the first bibliographical system published with a view to the use of books rather than the sale of books. [22] His classification scheme was therefore a working scheme useful in its application.

The .../

Serapio	M	XIII	8
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The sixteenth century also produced Florianus Treflerus, a benedictine monk, who formulated a classification scheme of some sort.[23] His scheme was not considered practicable since it was not based on any one principle. His books were sometimes classified by subject , and sometimes by form. It is interesting to note that these very principles not considered essential in those days are incorporated in present day rules for classifying. Other classificationists of the sixteenth century were Mario Nixolio [24] and Christofle de Savigny.[25]

The seventheenth century produced a number of schemes all on knowledge classification. Francis Bacon (1561-1626) opened the seventeenth century with his classification scheme 'Partitio Universalis Doctrinae ...' which was published in 1605. In his scheme, Bacon divided the field of knowledge into three great classes according to the faculty of the mind employed in each of the divisions:

I History (Memory)

II Poetry (Imagination)

III Science of Philosophy (Reason)

But this form of classification is purely a knowledge classification and proved unsatisfactory when applied to book classification. The invention of printing which by Western belief began in the middle of the fifteenth century had produced many books for the civilised world and there was need for proper organization of books in libraries. The then existing schemes were all based on knowledge

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CHAPTER FIVE

Practical Systems

At the end of the seventeenth century, especially in continental libraries, the practice was to divide books into certain number of general classes, and then to place them in fixed location according to size on the shelves set aside for each class. Books were sometimes put into classes in alphabetical order of authors' names, century and nationality were also used as the basis of sub-division.

Since there were no settled principles of classification, changes were frequent and one librarian undid the work of another. /27/

The need for practical schemes in libraries was answered and what were produced were still philosophical in character by virtue of the knowledge possessed by their formulators. Because knowledge is science, the classification of books with the aid of practical schemes became a science and not merely " a human creation for a human end". /28 / Before

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produced, there was a practical classification scheme for the classification of books in existence. It is accepted that book classification was in practice in ancient Egyptian and Hebrew temple libraries and the Assyrian and Babylonian libraries were also classified. Records show that the Alexandria Library was classified. The classification used was formulated by Callimachus (B.C. 260-240) [29] and it proved to be a practical classification scheme. It is even known that Callimachus used the catchword of a title to indicate the place of the book and this constituted a notation.

Apart from Callimachus's system for book classification, there were other book classification systems used by Mediaeval and monastic libraries but most of these were catalogues and bibliographies. There were the systems of the monastic libraies of St. Requier, St. Emmeram at Ratisbon and the Aldersbach Monastery. Practical systems were produced throughout the fourteenth, fifteenth, sixteenth, seventh and eighteenth centuries but they all obtained less popularity and very little is known about them exept that they were adopted in one or two libraries until they

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library .../

library and others were superceeded by better systems.

The nineteenth century was flooded with many practical systems for book classification. Of these, the system of the Bibliotheque Nationale had a measure of influence on them. This system which was published in 1802, has thirty main classes indicated by letters and has minute subdivisions. Yet another French system produced in the nineteenth century was that of Gustav Brunet. His work, 'Manual du libraire et de l'amateur de livres' which was formulated in 1810 was published in six volumes. The system was founded on actual titles and has many practical virtues. Beacuse of its practicability it was in vogue for quite a long time especially in Europe. In England, an attempt to formulate a practical system of book classification was made by Thomas Hartwell Horne in 1814. His work, 'An introduction to the study of bibliography', was received with enthusiasm and in 1836, the British Museum came out with a system formulated by Richard Garnett, Superintendent of the Reading-Room, British Museum. At a conference for librarians held in London in 1877, Garnett read a paper 'On the system of classifying books on the shelves followed at the British Museum!

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His .../

His paper was later printed as a pamphlet by the Chiswick Press. The outline of the British Museum system is as follows:

I Theology

II Jurisprudence

III Natural history and Medicine

IV Archeology and Art

V Philosophy

VI History

VII Geography

VIII Biography

IX Belles Letters

X Philology

Another British system was produced in 1859 by Edward Edwards, a great champion of librarianship. [30] Edwards became interested in classification especially when open access was introduced into libraries at the end of the nineteenth century.[31] He devised his own scheme and used it in Manchester. His system had six main classes classes:

Theology

Philosophy

History

Law, Politics and Commerce

Science and Art

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Law, Politics and Commerce

Science and Art

Literature and Polygraphy

In .../

In volume two of his 'Memoirs of libraries', Edward Edwards gave an account of the various systems which have been produced by past philosophers, bibliographers and scientists. Edwards's system was a scheme of classification suggested as suitable for town libraries of 30,000 volumes and upwards but a critical study of the scheme shows that it would not be practicable in a large library. In spite of its shortcomings his proposed scheme had admirers in the later years and among his admirers was Berwick Sayers.

From the time of Edwards's system to that of Harris's, many systems sprang up but they were of less significance. The system formulated by Harris, as many have come to believe, propelled the gratest and most popular system ever known. The system of W.T. Harris entitled 'Catalogue of the St. Louis Public School Library' was published in 1870. W.T. Harris was an American philosopher who was influenced by Francis Bacon. He deviced an inversion of Bacon's intellectual chart in the 'Advancement of knowledge' for the arrangement of his catalogue at the St. Louis Public Library.

Six years later, in 1876, Melvil Dewey (1851-1932), a junior librarian of Amherst College, Massachusetts had his system anonymously published under the title, 'A Classification and

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subject index for cataloguing and arranging the books and pamphlets of the library'. Since then the system has changed titles and the fourth edition was entitled 'Decimal classification and relative index for libraries'. Dewey's system has undergone several editions, revisions and enlarged in several ways. The Lake Pacid Club is the body responsible for these revisions and it is associated with the Library of Congress. The system has been translated into other languages such as Italian, German and French. The development of the Decimal Classification has created its own history and deserves special treatment. It will be inappropriate to squeeze it into this brief outline. Besides, the outlines of the Dewey system have been printed in several works on classification. The important point to mentioned here is that Dewey divided the field of knowledge into ten main classes. The first class he called the Generalia class represented by 0 and this is followed by the remaining nine classes numbered from 1-9. In the formulation of his system, Dewey was influenced by Harris as he himself tells us. No other system has enjoyed popularlity more than the Decimal Classification of Dewey although Dewey was not the originator of decimal systems.

From its inception in the late nineteenth century, Dewey's system still holds sway in the twentieth century and in spite of challenges from other modern schedules or schemes, it looks as if it can still hold its ground in the next century. There is no denying that later

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classificationists after Dewey held his system in contempt not because of its virtues but because of its shortcomings and of these, Bliss was the most outspoken. [33]

"The Decimal Classification is disqualified as an organisation of knowledge both structurally and functionally. It does not embody the natural, scientific, logical and educational orders. It fails to apply consistently the fundamental principles of classification. It is disproportionate in its expansion ... It is too often inadequate in its specifications and antiquated in its terminology, its index is far from complete. It is inefficient in classing the modern literature of specific topics and special aspects of general topics. It is confusing in its complexities ... It is antiquated and inadequate product based on the plan of an undergraduate of six decades ago and never coherent or scientific or practical. And now it is hopelessly beyond reconstruction. Its international acceptance for bibliographical development is offset by the finding that for a bibliographical organization of knowledge, it is altogether too incohelent and unsystematic". [34]

Years after this outburst of criticism from one of the most celebrated scholars on library classification, the Decimal System of Dewey has not lost popularity. It has undergone

principles of classification. It is disproportionate in its expansion ... It is too often inadequate in its specifications and antiquated in its terminology, its index is far from complete. It is inefficient in classing the modern literature of specific topics and special aspects of general topics. It is confusing in its complexities ... It is antiquated and inadequate product based on the plan of an undergraduate of six decades ago and never coherent or scientific or practical. And now it is hopelessly beyond reconstruction. Its international acceptance for bibliographical development is offset by the finding that for a bibliographical organization of knowledge, it is altogether too incohelent and unsystematic". [34]

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After.../

After Dewey came Schwartz who produced "A mnemonic system of classification" in 1879. In the same year, C.A. Cutter (1837-1903) who was later to become one of the bulwarks behind American librarianship just as James D. Brown had been to British librarianship, produced his 'Expansive classification'[35] Cutter's system was published in 1891 and it was a classification scheme based on the books on the shelves of the Boston Athenaeum Library. There were seven expansions published as the stock of the library increased. The seventh expansion was minutely subdivided and incomplete because Cutter died before he could complete the work he began. The 'Expansive classification' could have been one of the best in use if Cutter had lived and also if there had been up-to-date revisions. The revision of classification systems require money and the men to do it and many systems which could not obtain these are gradually falling behind those with financial backing.

Librarians on both sides of the Atlantic were developing keen intereset in classification and a number of them ventured forward with classification systems for use in their libraries. Some of these industrious librarians are S.A. Allibone who produced the alphabetical subject system in 1880; Lloyd P. Smith whose work 'The classification of books' was published in 1882, Otto Hartevig whose work 'Schema des realcatalogs der ...' was published in 1888

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and W.I. Fletcher's library classification which appeared in full outline in volume four of the 'Library Journal' of 1889.

In Britain in particular, there was a movement to produce a system as a substitute to Dewey's Decimal system which was becoming too popular. James Duff Brown in particular was restless and in 1894, he combined with J.H. Quinn to produce a system for smaller libraries. Two years later in 1896, Brown produced his 'Adjustable classification' which was published in his 'Manual of library economy'. After years of unceasing effort, Brown came out with his 'Subject classification' [36] with which he hoped to oust Dewey from this little island of Father Neptune. But Dewey had come to stay and Brown's system published in 1906 was in vogue in England for some time and eventually proved a stranger among its own people. The subject classification has several good qualities and a careful reading of the introduction does not fail to pay handsome dividends. It shows how mature Brown was in his thinking. The system could have stood out miles ahead of other systems but for the one and major fault it has - it is condemned as being a "one place system". It has been left reposing on library shelves and graced as a national monument - "the best achievement in England of the classificatory art for library use" [37]

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Congress was published. This system was based on material already in the library and the outline of the system shows that it has been influenced by Cutter's 'Expansive classification'. The Library of Congress classification showed the need for co-operative production of systems for use in libraries and a stop to the existing tendency of producing one man schemes. It will be remembered that Brown earlier on had combined with Quinn to produce a system for use in smaller libraries. This attempt had to catch on and it was no surprise that the Library of Congress classification had to be a joint project by experts. The Library of Congress system was formulated by experts and specialists and it is the leading scheme in existence because it is practicable, flexible and adaptable. An outline was issued in 1904 but the system has been issued in sections since 1901. As its leading pioneer says, the Library of Congress system has not sought to follow strictly the scientific order of subjects. This is true to some extent but it should not be overlooked that the experts who formulated the Library of Congress system worked in relation with those speciality bordered theirs. The system makes use of letters and figures in its schedules. Like Dewey's Decimal classification, The Library of Congress classification also has its weak points. This is natural in a system of such dimensions. [38] It belongs to a great and fast growing library and it is used in other libraries inside and outside America. The Library

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of Congress Classification is still unfinished and it is the system which opened up the history of classification in the twentieth century.

The next major system which followed the Library of Congress Classification was the "System of the Brussels Institute" popularly known as the Universal Decimal Classification. It was originally issued in parts between 1899 and 1905. At the mention of this system, two personalities spring to mind. They are M.M. La Fontaine and Otlet who originally conceived the idea of formulating a universal index of documents but eventually their interests became an international concern. The history behind this system is well written in the Bulletin of the Institute. The system is based on the Dewey Decimal Classification and it was for some time called the Dewey Expanded System. [39] The system continues to expand and its schedules are revised by an international machnery made up of committees and panels. The system is widely used in Europe in libraries as well as in other business fields. The British Standard Institution publishes draft schedules of the Universal Decimal Classification.

The next system worth mentioning is the 'System of Bibliographic Classification' produced by Bliss in 1935. Henry Evelyn Bliss was undoubtedly a philosopher and a good librarian. He

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combined the ideas of the past and the present in his philosophical thinking and at the start of his introduction to his system he says:

> "What we call nature and what we express as life are so complex that our statement of what we know or think of them must be simplified in some measure, if we would have it comprehensible and communicable. This is the way of news and of history; it is also the way of science and of philosophy, of all organization of knowledge and thought."

With this in mind, Bliss formulated his theory of the classification of knowledge and produced his 'Organization of Knoeledge and System of the Sciences' in 1929. His second work on the theory of classification was the 'Organization of Knowledge in Libraries' published in 1933. Bliss undoubtedly contributed handsomely towards the study of classification and his system received international recognition even as far as in Africa where his scheme has been used to classify books in libraries.

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of S.R. Ranganathan an Indian Librarian who has done great credit to the profession. [40]. In 1933 the 'Colon Classification' of Ranganathan was published without any known theoretical basis. The basis was produced later and it became clearer that new principles in the formulation of classificatory system had been introduced. New terminology was introduced and the parlance of librarians became more pronounced. Terms like 'facet', 'array', 'chain', 'bias device', and 'postulates' have inculcated themselves into the heads of present day students of librarianship and all this is due to the contribution made by Ranganathan towards the study of classification as a subject for librarians. The theories of Ranganathan are embodied in his 'Prolegomena' and 'Comprehensive exposition of library classification theory' first published in 1937. As a mark of acceptance of the devices introduced by Ranganathan in his 'Colon Classification', the British National Bibliography used the 'chain procedure' to index subjects. Not only is the 'Colon Classification' useful for classifying material but it is also useful for indexing purposes.

The Color has not yet had a chance to make a great impact in the field of classification. Apart from its native country where it is in vogue, it is less used outside the Indian Sub-continent. The scheme and its underlying principles are now being studied at the North Western Polytechnic School of

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It was too premature to say that with the Colon, Ranganathan marked the end of the so called 'one-man-general-systems'. At a stage in the history of practical classification systems, the Library of Congress system pointed strongly towards systems being formulated by experts in subject fields. This was followed lamely by the 'Classification Decimale' of the Institut International de Bibliographic but the whole idea was blown sky high by James Duff Brown who came out with his 'Subject Classification' in 1906 despite the fact that knowledge had expanded so much so that it had ceased to be the property of any one person. Brown was followed by Henry E. Bliss with his 'Bibliographic Classification' in 1933 and then in the same year, S.R. Ranganathan followed with his 'Colon Classification'.

Just as it seemed that there was not the likelihood of anyone coming up with a general system, Fremont Rider, Librarian Emeritue of Olin Memorial Library, Wesley University, came out with his 'International Classification' which is intended as a system for the arrangement of books on the shelves of general libraries. The preface to this single volume work published in 1961 makes interesting reading. One of the underlying principles to this system is to,achieve a pure notation. This late general system has yet to make its impact on libraries and librarians but library classification is on the march and has just turned the corner towards specialization. [41]

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CHAPTER SIX

Special Systems

Classification has undergone a tremendous evolutionary process. From its primitive state, it has jumped the hurdles of time to the stage of adaptedness and improvement. The last stage it has to reach is that of stabilization and persistence.[42] It is doubtful if this stage will ever be reached. Present day knowledge and the rate at which it is expanding makes classification too sluggish to catch up with events. It was the reverse in the far distant past when the whole of knowledge was possessed within the walls of one academy. [43] To meet this problem, efforts are being made to provide for special fields of knowledge in order not to leave gaps in the classification of knowledge. In this sphere, librarians are foremost in their efforts to champion the course of special schemes. Traditionally, librarians think of classification in terms of knowledge and books and it is not surprising that while they are seeking special systems, they make it their aim to see to it that these special systems would suit the arrangement of books on their shelves. Some of these special systems are formulated to cater for the libraries of industries, scientific institutions and private libraries. Very useful special schemes have been produced in America, Britain,

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were adapted from existing systems. Examples are the Harvard 'Classification of Business Literature', the Barnard 'Classification for medical Libraries', the 'Classification of the Library of Union Theological Seminary in the City of New York', by Julia Pettee which was published in 1939, and the 'National Library of Medicine Classification: a scheme for the Shelf Arrangement of Books in the Field of Medicine and its Related Sciences', published in 1951.

In Britain, J.E. Holmstrom produced a special classification system which he named 'Classification under Ramified Keywords'. His system which was an alphabetical classification system under subject headings, was adapted to various technical fields. Other contributions towards special systems were made by E.G. Brisch and J.E.L. Farradane. The latter tried to solve the problem of relations between subjects in an original way.

To give incentive to the construction of special systems, the Classification Research Group was formed in Britain in 1957. The Group is made up of special librarians who are interested in the advancement of classification. Most of the special systems produced in Britain have been formulated by members of the Group, among whom are D.J. Foskett, B.C. Vickery and Miss Barbara Kyle. Foskett has formulated many special systems

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of which some have been published. The Metal Box Company's classification, the classification established for the food industries and the classification on health and occupational safety are in current use. Foskett is a goodwill disciple of Ranganathan. Vickery's contributions include a classification scheme for astronomy, a book entitled 'Classification and Indexing in Science', and a published guide to the use of the facet method in specialised classifications. Barbara Kyle has been specialising on a classification of social sciences and her schedules are published in the form of documents. Document V which is a table of the classification came out in 1957.

It has been pointed out that these special systems are not the be all and end all of everything. They fall short in many respects and the problem presented by special systems has been pointed out by D.J. Foskett.

> "I believe that the reverse is the case. After making several special schemes in which the field is more or less defined, I have come to the conclusion that special schemes, so far from being the only possible solution, are in fact distortions that are bound to fall short of success if operated in isolation from the rest of knowledge ..." [44]

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